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WILLIAM W. CAMPBELL III, NATIONAL GEOGRAPHIC STAFF

GELÄNDESPRUNG **is the skier's word for this pole-assisted jump**

- Winter in Switzerland
- Alpine Skiing
- Iraq's Mysterious Marshmen
- *Nautilus* Under the Ice
- Russell Cave—Gift to U. S.

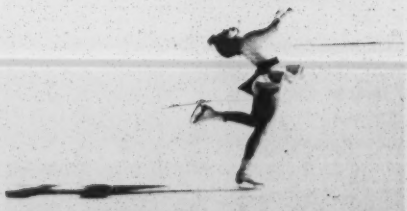
NEXT WEEK: *Detailed report on Israel, 10-year-old nation in the midst of federating Near Eastern Lands.*

into a blaze of sunlight. Then a village appears like a welcome mirage on the blinding slopes.

"Arosa!" calls the conductor. Horse-drawn sleighs with tinkling bells and fur blankets stand ready to whisk guests to gay chalets and hotels nestled along the Alpine cove.

A bright island of hospitality (above), Arosa snuggles some 6,000 feet above sea level. Less than half a century ago it was a mountain hamlet with only 50 inhabitants. Today, due to its superb facilities for winter sports, it plays host to more than 6,000 visitors a year.

Tiny Switzerland—terribly poor in soil and raw materials—has wisely taken advantage of her greatest asset, magnificent scenery, and based the national economy on it. Alpine villages that were virtually marooned in winter a few decades ago now thrive. Railroads and planes feed them with tourists by the thousands from



all over the world. And the Swiss—themselves a melting-pot people of Helvetian, Roman, Germanic, and Gallic stock—know all the niceties of making a stranger welcome.

In Davos, near Arosa, a horse show attracts thoroughbreds from many countries to compete for high jumping honors on the snow (above). Davos also boasts the largest natural ice rink in Europe (left) as well as one of the world's best downhill ski runs.

But the undisputed king of Switzerland's winter resorts is St. Moritz, twice host to the winter Olympic Games. Its skiing challenges top athletes of Europe and America. Bobsledding originated here. Skating, curling, and hockey keep its ice rinks crowded. And horse-race addicts cheer thoroughbreds thundering around St. Moritz's frozen lake.

Oldest Swiss winter resort, St. Moritz first saw skiing a century ago—long before the sport caught on throughout Switzerland. Skiers caused local eyebrows to raise back then. They boost a nation's finances now. K. C.

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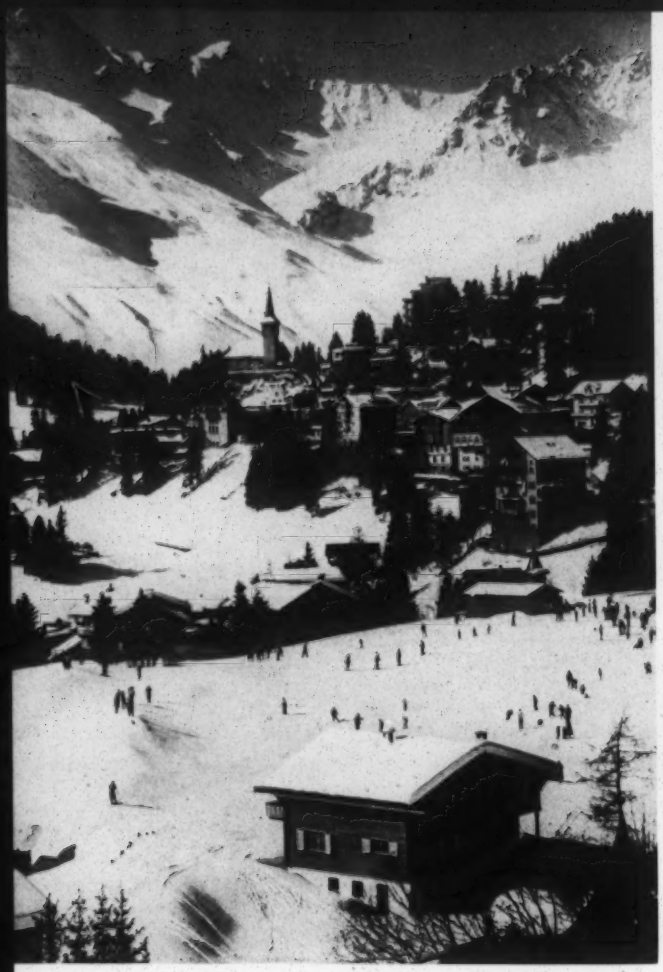

Swiss Winter Beckons Tourists

Photographs by William W. Campbell III, National Geographic Staff

Geography left little Switzerland with a white elephant—the soaring Alps. Farms, clinging to mountain walls, earn meager livings. But the Swiss use their peaks for all they're worth—for water, for defense, and notably for sheer physical beauty. To view them, people pay handsomely.

WANT to visit Arosa? To reach this hamlet (above), set like a gem in the high crown of Switzerland's Alps, you start deep in a valley at the town of Chur. There, from December through March, winter sports fans gather from all over the world. Bundled tight in ski pants, brightly colored hats and mittens, bulging knapsacks strapped to backs, they wait for the tiny electric trains that will take them thousands of feet high into the Alps.

A bright yellow train slips silently into Chur on its electric cable. Skis clatter, boots scuffle. A babble of tongues fills the station. "Au Revoir," "Auf Wiedersehen," "See you soon." With a small toot, the train rolls out, winds through a narrow pass, and into a panorama of towering peaks.

Inching perilously along jagged precipices, coaches soar above forests of crystallized trees, plunge through tunnels striped with 15-foot icicles, and rattle over lacy bridges that span frightening chasms.

The temperature drops as the train climbs—above timberline, above clouds,

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SKI SCHOOLS dot Switzerland. Most pupils are children of visitors. Local youngsters begin skiing as soon as they can walk, grow to be champions, below.

SWISS NATIONAL TRAVEL OFFICE

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To its devotees, skiing is more than a sport—it is a way of life. It combines glories of scenery, warmth of comradeship, and comforts of food and fireplace with the bounding joy of slamming down a steep white slope. Those who have tasted its delights form an international brotherhood. They may hail from New Hampshire, Colorado, Austria, Norway, Chile, or New Zealand, but they understand each other. And sooner or later, it seems, they meet in Switzerland.

Winter in the Alps means big business. Hotels and chalets welcome the invasion. Guides and instructors test the snow, watch for avalanches, and report conditions in three languages on bulletin boards, right.

Skiers Awaken the Alps

PHOTOGRAPHS BY WILLIAM W. CAMPBELL III, NATIONAL GEOGRAPHIC STAFF

Swiss skiing starts around Christmas and lasts into April. High in the Alps, ravines and ledges are packed with snow so that slopes take on new contours—white meadows rolling down from high peaks like the Matterhorn, left. Here the skier can make a run as varied as his imagination and ability.

Swiss slopes were seldom scarred by skis until about half a century ago. An ancient means of transportation in Norway, skiing was little known elsewhere. And once the Swiss mountains were wrapped in winter they were considered too dangerous for exploration. Villages hibernated when snow fell.

Then the sport arrived. Dazzling snow fields now ring with voices and blaze with color. The world's wealthy mingle with the world's top skiers. Mountains come alive—and little valley hamlets prosper from their white gold.

See the October, 1956, *National Geographic Magazine* on "Surprising Switzerland."

Ma'dan Miniatures

GAVIN MAXWELL; WILFRED THESIGER, RIGHT

ing water. They house buffalo in long annexes of their own collapsible dwellings.

Many Ma'dan owe allegiance to sheiks living outside the marshes. Some serve as bodyguards (above, right) to these landlords. Most round out lives in settled, water-hemmed villages on a narrow economy of rice, speared fish, and the weaving of reed mats sold to visiting merchants. Each morning, men pile into indispensable canoes, followed by women and children (above, center). The task: to gather dried reeds for fuel or matmaking, or to fish. Green shoots from recently burned reed beds are collected for buffaloes. This chore continues in winter, though it means wading waist-deep in icy water. But stout spirits revive with merriment and song.

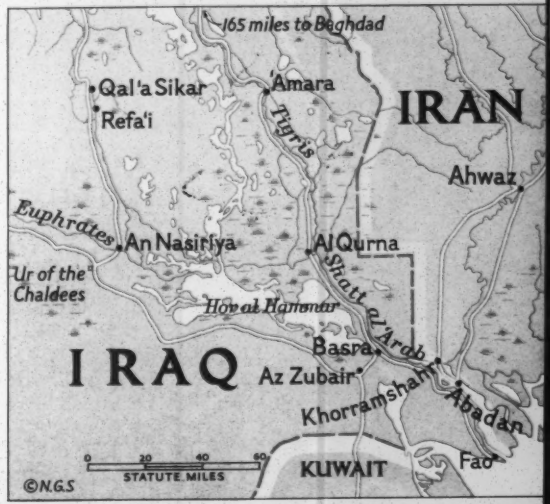
Pleasures are simple—bright headdresses, occasional hunts, dancing, singing, and sporting dogfights. Weddings are paramount events. A bride from a distant village is escorted by friends of the groom. The canoers make merry at villages en route to the wedding. The bride has a price tag—about three buffaloes, payable to her father. Unlike most Moslems, Ma'dan women never wear veils.

Most houses stand on reedy platforms made of successive layers tamped down for foundations. Every family boasts at least one canoe.

Some use the *tarada,* a war canoe with a high, curved bow that combs weeds aside.

Spring, lasting only a month, turns backwaters to floating meadows of white buttercups, flowering ranunculuses, yellow or snow-white nymphoides. You might think you could walk across them. But tortuous waterways walled in by reed beds remind marshmen of their treasured isolation.

S. H.



LIFE IN IRAQ'S MARSHLANDS

Hermit People Built a Culture on Soggy Foundations

WILFRED THESIGER

FEW OUTSIDE travelers leave footprints in southern Iraq's vast marshland, surrounding the lower Euphrates and Tigris Rivers. There are good reasons. Primitive Ma'dan inhabitants, part Arabian, Persian, Babylonian, and Sumerian, eye outsiders suspiciously. And it takes determination to reach their sequestered 6,000-square-mile homeland, a monotony of vegetation, mud, and water—rising water in flood times. Changing seasons bring blanketing heat, biting cold. Tormenting insects abound. Razor-tusked wild boars, deadly enemies, charge to kill. Marshmen hunt them down in reedy lairs by canoe (left).

Yet Iraq's marshland has its fascination—the unique way of life that the Ma'dan have developed to cope with their strange, inhospitable surroundings. They build cathedral-like houses of reeds, miracles of lashed and interwoven handiwork. Lacking wood, they use 20-foot reeds to achieve delicacies of design. The art stems from original inhabitants of the Tigris-Euphrates region, 6,000 years ago—a little-known cultural enrichment for the new Iraq-Jordan federation.

Marshmen depend on water buffaloes, providers of milk, cream, butter, and leather. At evening the ungainly beasts are allowed to lounge outside houses (opposite, left). At dawn they splash heavily into water and swim for grazing grounds. Some seminomadic families winter their herds on ground exposed by reced-

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Gothiclike Arches Take Their Shape Out of Wrapped Reeds

OF necessity, reeds are the marshman's building materials. He gathers them, ties them into tight bundles, then "transplants" the bundles in two straight rows as far apart as the width of his projected house. Mounting a scaffold made by forming a tripod of reed bundles, the house builder bends his ribs together and lashes them, left. Long sheaves bind the series of arches. Overlapping reed mats are sewn over the framework.

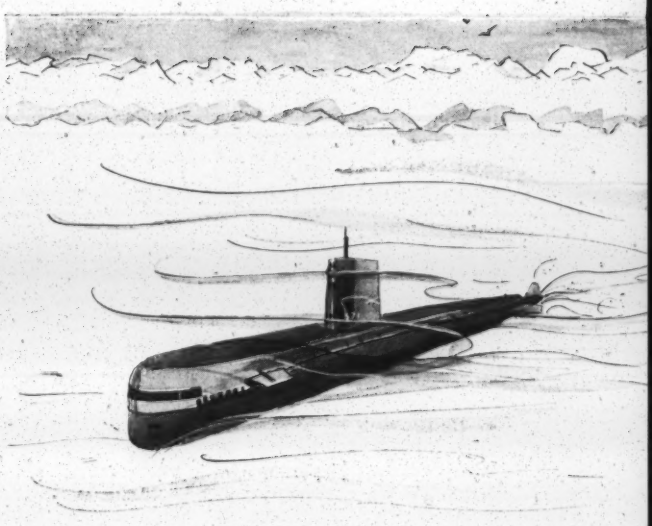
Vaulted *mudhifs*, or guest houses, are larger and stronger. Some stretch more than 100 feet. Here sheiks entertain visitors (right) with tea brewed for half an hour. Doorways always face Mecca. The ever-present marsh and quiet-moving canoes are just outside.

The Ma'dan handle their canoes in early childhood, but retain a healthy respect for open water in foul weather. Perils are described by Wilfred Thesiger in "Marsh Dwellers of Southern Iraq" in the February, 1958, issue of the *National Geographic Magazine:*

"I was crossing unprotected water about eight miles across. It was a calm, still morning when we started, but when we were halfway across we heard the wind. Had there not been a large sailing boat near by to take us aboard, we should certainly have drowned."

Gavin Maxwell, whose pictures appear in this story and the *National Geographic* feature, has written "People of the Reeds" (Harpers), a new book about Iraq's marshmen.

PHOTOGRAPHS BY WILFRED THESIGER



NAVY'S EXPLORERS filled a gap in knowledge. Ice pack, they discovered, is a huge, constantly moving mass. Mostly it consists of floes, some broad in area but only 10 to 12 feet thick. Underside of ice is jagged, not smooth. *Nautilus* was able to locate open "leads" or polynyas in the pack and "thread the needle"—easing to the surface within the open area like a whale.

DOTTED LINE shows the approximate track of *Nautilus*'s 1957 Arctic voyage. After emerging from ice pack (loop in track line), she sailed on to NATO maneuvers off England. Here she set another record, cruising more than 5,000 miles in 14 days without surfacing. In all, *Nautilus* covered 62,000 miles on her first allotment of uranium, an amount smaller in size than a light bulb. Now on her second "shot" of atomic fuel, sub has passed 100,000 miles. [All distances are nautical miles.]

BURNSIDE remembers chowtime. Miles from shore, under the Arctic ice, submarine food tasted good. Off watch, men played cards, listened to jazz records, and watched movies.

As *Nautilus* swam northward, her compasses reacted strangely. At 83 degrees north latitude the magnetic compass needle began swinging in great arcs across the dial, driven mad by the magnetic north pole. One old style gyrocompass also went crazy—but a new gyro, designed for high latitudes, behaved. At 85 degrees it still worked.

Then at 86 degrees it went berserk—but from simple power failure rather than the effects of high latitude. Though power was quickly restored, Commander Anderson knew that it takes hours for a gyrocompass to settle down. He felt his way to 87 degrees, then swung around and came out from under.

Nautilus had reached a point 180 miles from the North Pole—the farthest north for any ship. The 1,000-mile, five-and-a-half-day voyage showed that a submarine could traverse the Arctic Ocean. *Nautilus* gathered the first details of the ice pack's underwater face and of the currents that roam beneath it. A.P.M.

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How the Atom-Powered Nautilus *Went*

Exploring Under Arctic Ice

AH-UUU-GAH, ah-uuu-gah boomed the diving horn, sending 18-year-old Bob Burnside, right, and his shipmates scurrying to diving stations. "Dive! Dive!" came the order. Down hummed the periscope as *Nautilus* buried her rounded snout in the gray sea. The great nuclear submarine slid down to 300 feet where her crew brought her level and set course for due north.

It seemed like just another dive. But Burnside knew better. His ship had just plunged beneath the ice pack that blankets the Arctic Ocean. *Nautilus* was moving like a big black fish into an unexplored underwater cave. "I always felt there was a roof above us," he recalled later.

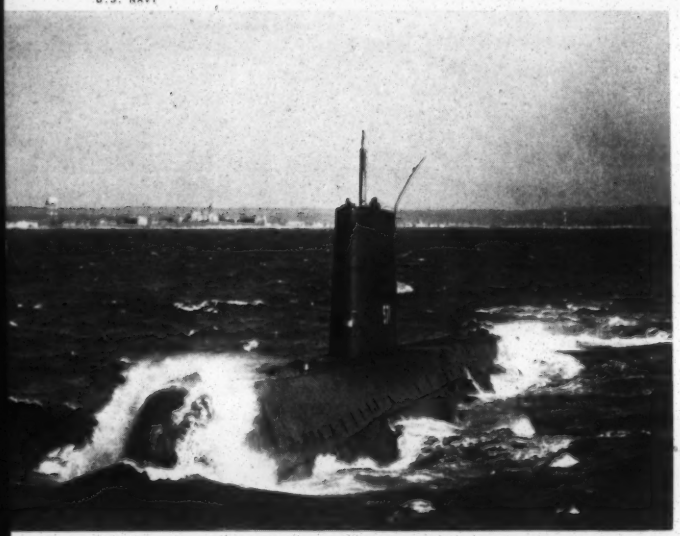
Actually, *Nautilus* was proceeding far from blindly on her record-shattering cruise under ice. Advanced sonar (underwater sound) systems gave her skipper, Commander William R. Anderson, USN, a clear picture of the ceiling of ice overhead. Other electronic feelers probed the sea bottom. Through his periscope, the skipper noted the water was gray, not the usual black. Diffused sunlight, filtering through the ice, lightened its shade. He later wrote that the ice pack "seemed to be scudding overhead like gray clouds."

Within the sub everything was cozy and routine. Burnside stood his four-hour watches, checking communications, air conditioning, refrigeration, and electrical equipment.

BOB BURNSIDE is one of the new breed, a nuclear sailor. After high school in Philadelphia, Bob signed into the Navy and volunteered for submarines. Sub School at New London, Connecticut, fitted him for *Nautilus*. Soon he will come ashore for further study on nuclear power.

Was he worried about the voyage under ice? "No," says Bob, "I knew she could do it."

U.S. NAVY



NAUTILUS on the surface presents a matronly appearance. Waves break over a bow designed for efficient travel underwater. Nearly as big as a destroyer, she carries 80 men on two levels. Nuclear reactor is housed just aft of sleek conning tower. Reactor heats water, turning it to steam to drive turbines. The sub betters 20 knots when submerged.

BROOKS NONEYCUTT

NGS PHOTOGRAPHER BATES LITTLEHALES

From the National Geographic Society

RUSSELL CAVE: GIFT TO U. S.

DR. Melville Bell Grosvenor, President of the National Geographic Society, recently announced the gift of Russell Cave to the American people. The National Park Service, accepting the Alabama Stone Age site as a national archeological monument, is taking steps to open it for public inspection.

By far the oldest site of human habitation yet found in southeast United States, Russell Cave has yielded amazing scientific secrets to Smithsonian Institution archeologists (see NGM, Mar. '58 and Oct. '56, and GSB, Oct. 15, '56). In 1956, to safeguard research, The Society bought the farm on which the cave is located.

Bone fishhooks give clues to long migrations 9,000 years ago.